



China:

Ambitious Targets and Policies

Warwick J. McKibbin

Nonresident Senior Fellow, Economic Studies and Global Economy and Development, Brookings Institution

Weifeng Liu

Research Fellow, Center for Applied Macroeconomic Analysis, Crawford School of Public Policy, Australian National University

Over the last decade China has been actively engaged in improving energy efficiency and direct interventions aimed at addressing rising carbon emissions. As the world’s largest emitter of greenhouse gases, China has made a number of commitments in the lead up to the meeting of the Conference of the Parties to be held in Paris in December 2015. In its Intended Nationally Determined Contribution (INDC), China committed by 2030:

- To achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early;
- To lower CO₂ emissions per unit of GDP (emissions intensity) by 60-65 percent from the 2005 level;
- To increase the share of non-fossil fuels in primary energy consumption to around 20 percent; and
- To increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level.

These commitments are reinforced in the two joint announcements ([here](#) and [here](#)) between the United States and China in November 2014 and September 2015, respectively. In addition to the 2030 commitments, China has announced a target for 2020 to reduce the emissions intensity of its economy by 40-45 percent relative to 2005. China has also announced targets in its Five-Year Plans (FYPs). Figure 1 presents China’s targets over the 11th FYP (2006-2010) and the 12th FYP (2011-2015), as well as targets in 2020 and 2030.

Figure 1. Chinese energy and emission targets (%)

	2006-2010	2011-2015	2020	2030
Energy intensity reduction	20 (2005)	16 (2010)		
Emissions intensity reduction	17 (2010)	40-45 (2005)	60-65 (2005)	
Non-fossil fuel shares	10	11.4	15	20

Source: National Development and Reform Commission of China (2015). *Enhanced Actions on Climate Change: China’s Intended Nationally Determined Contributions*.

Note: The years in brackets indicate the base years with which the targets are compared.



To achieve these goals, China announced substantial domestic climate actions in the joint statement with the U.S. in September 2015, in which China confirmed that in 2017 it plans to launch a national emission trading system (ETS) covering key industry sectors as well as implement a green dispatch system to favor low-carbon sources in electricity distribution. China has also announced that it will make available 20 billion yuan for setting up the China South-South Climate Cooperation Fund to support other developing countries in combatting climate change.

On November 2, 2015, French President Francois Hollande visited China to boost the upcoming climate negotiations and the two countries released a joint presidential statement on climate change. The two countries agreed that every five years the Paris agreement should be comprehensively reviewed, evaluating the overall progress made toward reaching the agreed-upon long-term goals. Both countries reaffirmed their commitment to shifting the world to a low-carbon path by the end of the century and stressed the responsibility of developed nations in helping developing nations mitigate and adapt to climate change, both through finance and technology.

The targets so far announced show that China is positioning itself as a leader in climate action. This is quite different from six years ago in Copenhagen when China was accused of thwarting attempts at establishing legally binding targets for carbon emissions.

Even though China's carbon emissions will likely continue to rise until 2030, how serious is the Chinese commitment? In a recent report commissioned by the Australian government, one of the authors of this brief, Warwick J. McKibben, found that the targets announced by China by 2030 incurred the second-largest cost to GDP of all the countries modelled. If measured by economic costs rather than the overall emission target, China's commitments to 2030 are significant.

Although the ambitious targets are likely to be relatively costly for China to achieve, there are several reasons why China is likely to follow through with its carbon pledges at the COP21. China has a number of domestic reasons for taking action. First, China is concerned about energy security driven by rapidly growing energy demand, a coal-dominated energy structure, and high and growing dependence on oil imports. At a high-level meeting in June 2014, President Xi Jinping called for a sweeping energy revolution in China in five areas: demand, production, technology, institutional governance, and global markets. Second, China faces an urgent need to tackle pollution from fossil fuels. In China, coal burning is responsible for most emissions of air pollutants such as sulfur dioxide, nitrogen oxides, suspended particulates, and overall air quality. The outcomes in these areas are deteriorating. Deadly smog, particularly in northern China where Beijing is located, has escalated into a major social issue in the last few years. In September 2013, six ministries jointly launched the Air Pollution Prevention and Control Action Plan (in Chinese) in the Beijing-Tianjin-Hebei Region requiring PM2.5, or "fine particle," concentrations in the Beijing-Tianjin-Hebei Region to be reduced by 25 percent in 2017 from the 2012 level.



China is also one of the countries where estimates of cost from climate change in future decades are significant. China is large enough for local actions to have global consequences.

Also, China has already taken a series of domestic actions in the last decade and has recently announced additional policies that will likely lead to significant emission reductions in future years, giving a real foundation to the pledges being made in Paris.

Recent policies

To achieve its energy and emission goals, China has implemented a series of energy and climate policies in the last decade but has mostly relied on command-and-control measures. The major programs include the Top-1000 Enterprises Energy Conservation Action Program during the 11th FYP; the 10,000 Enterprises Energy Conservation Action Program during the 12th FYP; the low-carbon city development pilot program; and mandatory closure of small power plants.

China's leadership has realized that administrative measures are not efficient, and it has gradually shifted to market instruments. As an overarching guidance, the Third Plenum of the 18th Central Committee of Communist Party of China in 2013 decided that markets play a decisive role in allocating resources. The market instruments include price reforms, subsidies and taxes, and emissions trading schemes. China has been moving away from centrally controlled price systems to market-oriented pricing mechanisms.

The most striking carbon policy in China is carbon trading pilots. Seven pilot ETS have been launched over 2013-2014: Shenzhen, Shanghai, Beijing, Guangdong, Tianjin, Hubei, and Chongqing. They apply to energy-intensive sectors covering 35-60 percent of the total emissions of the respective region and all together roughly 10 percent of the nation's total emissions. These pilots combined make up the second-largest ETS in the world following the European ETS. They cover 650 million to 700 million tons of CO₂ in 2014, compared with 2.1 billion tons in Europe, 382 million tons in Australia and 165 million tons in California. Although they are by no means mature markets and still face potential challenges, including a surprising lack of price volatility, the pilots have a significant demonstration effect for China's future national market.

Apart from the above policies, China is transforming its economy and energy systems, which will also have significant impacts on energy consumption and carbon emissions. To conserve energy and mitigate emissions, China has been restructuring its economy by upgrading traditional industries, supporting strategic and newly emerging industries as well as expanding the service sector, and phasing out backward production capacity. In 2013, the services sector was larger than the industrial sector for the first time.

In terms of energy structure, the government has started to tighten coal consumption. For example, in the Air Pollution Prevention and Control Action Plan in the Beijing-Tianjin-Hebei Region, the total

coal consumption of Beijing, Tianjin, Hebei, and Shangdong is required to be reduced by 83 million tons by 2017. The government has also been accelerating the development of renewable energy—particularly solar and wind power. Figure 2 shows rapid growth in generation capacity of non-fossil fuels in the last five years.

Figure 2. Generation capacity of non-fossil fuels in China over 2010-2014

	2010 (Gigawatts)	2014 (Gigawatts)	Growth over 2010-2014 (Percent)
Hydro	216.06	301.83	39.7
Wind	29.58	96.37	225.8
Biomass	5.50	9.48	72.4
Solar	0.86	28.05	3,161.6
Geothermal	0.03	0.03	7.1
Nuclear	10.82	19.88	83.7
Total	262.85	455.64	73.3

Source: *China National Renewable Energy Centre.*

Upcoming policies

China’s ETS pilots have paved the way to a national ETS in 2017. There are two prevailing views on the development of a national carbon market. One is to expand these pilots in geographical coverage and sectoral scope, and the other is to construct a uniform national market based on experiences and lessons of these pilots. While local governments are cooperating on the research of cross-region trading, the central government may not roll out a national system by linking the pilots; more likely, it will construct a new uniform national system because of significant differences among the pilots.

China is also considering carbon taxes. The Draft Environment Tax Law (the carbon tax) was issued in May 2013 by the Ministry of Finance and sent to China’s most carbon-intensive industry associations for comments and review. Finance Minister Lou Jiwei confirmed that China would expand environmental taxes to include carbon “in due time” at the China-U.S. Strategic and Economic Dialogue in July 2013. It is expected that the tax will likely come into force in the 13th FYP.

However, even if a carbon tax is also going to emerge in the 13th FYP, it is not clear how China is going to simultaneously impose both a carbon tax and an ETS. As the national ETS will be covering key industry sectors such as iron and steel, power generation, chemicals, building materials, paper-making, and non-ferrous metals, regions or firms in the carbon markets would be excluded from the carbon tax to avoid overlapping.

Apart from the carbon trading and the possible carbon tax, the Chinese government requires the share of non-fossil fuels in primary energy consumption to be 15 percent by 2020 and 20 percent by 2030. To achieve these targets, China is going to implement a green dispatch system to favor low-

carbon sources in electricity distribution. This system will accelerate power generation from renewable sources and, in turn, China's rapidly growing solar and wind capacity will support this system. In its INDC, China aims to further increase wind capacity to 200 GW and solar capacity to 100 GW by 2020, doubling wind capacity and more than tripling solar capacity from 2014.

To sum up, China has significant incentives to follow through with its carbon pledges at COP21. The gains to domestic issues such as local pollution and energy security make China a credible player in the global negotiations. The move toward concrete market-based mechanisms for pricing carbon, if they can be credibly implemented, will further drive the energy revolution slowly underway in China.

China's INDC and global INDCs

On October 30, 2015, the U.N. released a report showing that the aggregate effect of the 119 INDCs communicated by 147 parties by October 1, 2015 is not sufficient to maintain a temperature rise below 2 degrees Celsius. China's INDC and the joint announcement with the United States may break the deadlock of climate negotiations between developed countries and developing countries and enable further ambition in achieving the global emissions target, but this depends on how other countries perceive China's efforts and ambition of these targets.

China is in a very different position at COP21 in December 2015 than it was in Copenhagen in 2009. China has announced an ambitious INDC, and despite emissions projected to continue to rise until 2030, the commitment to addressing emissions in China is being backed by credible policies. While the U.N. has made it clear that the overall commitments for the COP21 are not sufficient to reach the 2 C target, China's contributions to the overall negotiations at the COP21 are likely to be real and credible. The crucial issue is not how to make China take action. It is how to encourage all countries to take greater action than so far pledged for the Paris meeting.